

## **REMARKS**

### ***Summary of Amendments***

Claim 4 has been newly amended over the version of this claim presented in Applicant's reply of January 29, 2007.

In particular, claim 4 now recites, "a continuous recirculation-path circuit . . . including, in a continuous circuit, an inlet end immersed into said reaction-mixture tank . . . and an outlet end immersed into said reaction-mixture tank." This amendment is supported by paragraph [0033] of the specification as filed, where the specification describes recirculation-path inlet and outlet ends, each immersed into the reaction-mixture tank.

No other amendments have been made. Claims 5, 6, 8 and 13-17 were canceled in Applicant's June 9, 2006 reply to the previous Office action. Claims 4, 6, 7, and 9-12 are currently pending before the Examiner.

### ***Claim Rejections – 35 U.S.C. § 103***

#### **1. Claims 4, 6, 7 and 9-12; combined disclosures in Haff et al. '413**

Claims 4, 6, 7 and 9-12 remain rejected as being unpatentable over a combination of embodiments disclosed in European Pat. App. Pub. No. 0 636 413 A2 to Haff et al.

Applicant and Applicant's counsel greatly appreciate the Examiner's having given the careful consideration to Applicant's reply of January 29, 2007 that the Examiner gave to Applicant's reply prior to that, and having provided a detailed explanation, in the continuation sheet appended to the Advisory Action of February 21, 2007, of the Examiner's position as to why that reply did not place this application into condition for allowance.

Applicant stands by the remarks in Applicant's January 29, 2007 reply. Nevertheless, claim 4, the lone independent claim currently pending before the Examiner, has been amended to distinguish all the more clearly over *Haff et al.* In particular, claim 4 now recites

a continuous recirculation-path . . . including, in a continuous circuit, an inlet end immersed into said reaction-mixture tank, a coiled heat-exchange section immersed into the denaturing isothermal tank, a coiled heat-exchange section immersed into the annealing isothermal tank, a coiled heat-exchange section immersed into the elongation

isothermal tank, and an outlet end immersed into said reaction-mixture tank, the recirculation-path therein being arranged to circuit from and back to the reaction-mixture tank by way of the respective coiled sections immersed into the denaturing, annealing and elongation isothermal tanks and connected by intervening out-of-tank sections

Column 10, lines 44-48 of *Haff et al.*, in the passage quoted in Applicant's January 29, 2007 reply, teaches employing a 4-way valve whereby "reaction product from the length of tube 22 in the low temperature bath 18 can be pumped back into the high temperature bath 16 to commence a new cycle."

Even if one were to make the grossly over-simplified, and technically suspect, allegation that the present invention merely replaces the 4-way valve of *Haff et al.* with the presently claimed reaction-mixture tank, that allegation would lack grounds, in *Haff et al.* or in any other prior art of record, evidencing *prima facie* a motivation to make such a replacement.

Column 11, lines 17-23 of *Haff et al.* state:

In addition, the small [of the loop of capillary tubing constituting the reaction tube 22 in the device of Fig. 1] size permits the use of an air bubble or an immiscible fluid such as an oil to be used as a discontinuity to demark the ends of the reaction mixture sample volume and as a pusher to drive the reaction mix predictably through the baths 16 and 18 via the peristaltic pump 12 and through the 4-way valve 14.

This need for a discontinuity is also addressed by Larzul in U.S. Pat. No. 5,176,203, cited, as noted in Applicant's previous reply, by *Haff et al.* in the background of their disclosure. Larzul teaches attracting a magnetic "slug" demarking the mixture in the reaction tube, with a magnetic arm that thus draws the mixture through the tube.

In the present invention, in contrast, the reaction-mixture tank eliminates the need for "demarking the ends of the reaction mixture sample."

Furthermore, column 12, lines 51-55 in *Haff et al.* state:

An air bubble or other fluid discontinuity is useful between each sample to push the entire sample as a unit along the capillary flow path. Otherwise a parabolic flow profile would exist across the capillary.

In the present invention, in contrast, the reaction-mixture tank can serve as an offsetting means, to equilibrate any such nonlinear distribution in the flow profile.

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In short, the present invention as now recited in claim 4 is rendered by a unique combination of features that for at least the foregoing reasons distinguishes over any and all disclosure, teaching, or suggestion in *Haff et al.*

Since claim 4 is thus believed to be allowable over the prior art of record, it is respectfully submitted that the other pending claims, claims 6, 7 and 9-12 also rejected under this section, should also be held allowable as depending directly or indirectly from claim 4.

Accordingly, Applicant courteously urges that this application is in condition for allowance. Reconsideration and withdrawal of the rejections is requested. Favorable action by the Examiner at an early date is solicited.

Respectfully submitted,

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